SECTION 17260 - HORIZONTAL SYSTEM CABLING

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. General:

1. Provide a complete Horizontal Cabling system that supports voice, data and video as indicated in Project Documents.
2. Provide telecommunications room racks, telecommunications room rack mounted termination equipment, telecommunications room cross connect and equipment patch cords, work area telecommunications outlets, work area telecommunications equipment cables, terminations, labeling and testing for the Horizontal Cabling system as indicated in Project Documents.
3. Provide Telecommunications Grounding and Bonding of all Horizontal Cabling system components as indicated in Project Documents.
4. Provide Firestopping Materials for Horizontal Cabling as indicated in Project Documents, provide all labor and materials to maintain Firestopping at all penetrations at all times during construction and to insure adequate Firestopping at all penetrations at completion.
5. Provide all necessary materials and labor for the Horizontal Cabling system in all Telecommunication Entrance Facilities, Telecommunications Rooms and Telecommunications Equipment Rooms as indicated in Project Documents.

B. Horizontal Cabling Subsystems:

1. Fiber Optic Horizontal Cabling System

    a. Provide a complete Fiber Optic Horizontal Cabling system as indicated in Project Documents.
    b. Provide Fiber Optic Horizontal system cables, telecommunications room rack mounted fiber optic termination enclosures, telecommunications room fiber optic cross connect and equipment patch cords, work area fiber optic telecommunications outlets, work area fiber optic telecommunications equipment cables, fiber optic terminations, labeling and testing for the Fiber Optic Horizontal Cabling system as indicated in Project Documents.

2. Unshielded Twisted Pair (UTP) Horizontal Cabling System

    a. Provide a complete UTP Horizontal Cabling system as indicated in Project Documents.

b. Provide UTP Horizontal system cables, telecommunications room rack mounted UTP termination equipment, telecommunications room UTP cross connect and equipment patch cables, work area UTP telecommunications outlets, work area telecommunications equipment cables, UTP terminations, labeling and testing for the UTP Horizontal Cabling system as indicated in Project Documents.

3. Coaxial Horizontal Cabling System

a. Provide a complete Coaxial Horizontal Cabling system as indicated in Project Documents.
b. Provide Coaxial Horizontal system cables, telecommunications room rack mounted coaxial termination equipment, telecommunications room coaxial cross connect and equipment patch cords, work area coaxial telecommunications outlets, coaxial terminations, labeling and testing for the Coaxial Horizontal Cabling system as indicated in Project Documents.

C. Telecommunications Grounding and Bonding

1. Provide complete Telecommunications Grounding and Bonding of all Horizontal Cabling system components as indicated in Project Documents
2. Provide connection of all Horizontal Cabling system components to Telecommunications Main Grounding Busbar (TMGB) or Telecommunications Grounding Busbar (TGB) as indicated in Project Documents.
3. It shall be the responsibility of this contractor to ensure that the Telecommunication Grounding of all Horizontal Cabling system components for this facility is continuous, complete, and meets or exceeds all applicable codes and standards.

1.2 SCOPE OF WORK

A. Refer to Section 17100, paragraph 1.2 as well as Description of Work listed above.

1.3 RELATED DOCUMENTS

A. Structured Cabling System General Provisions - Section 17200

B. Backbone System Cabling - Section 17250

1.4 QUALITY ASSURANCE

A. Refer to Section 17200, paragraph 1.4.

1.5 SUBMITTALS

A. Refer to Section 17200, paragraph 1.5.

1.6 CONTRACTOR QUALIFICATIONS

A. See Section 17200 for minimum qualifications.

PART 2 – PRODUCTS

2.1 GENERAL

A. Provide materials listed by UL or ETL.

B. All cable must be NEC type CMP unless otherwise noted

2.2 FIBER OPTIC HORIZONTAL CABLE

A. Specifications

1. Multimode fiber specifications:

a.	Provide graded index multimode fiber.	
b.	Attenuation (typ.)	3.0 dB/km @ 850nm 0.9 db/km @ 1300nm
c.	Attenuation (max)	3.7 dB/km @ 850nm 1.9 dB/km @ 1300nm
d.	Bandwidth	2200 MHz/km @ 850nm 500 MHz/km @ 1300nm
e.	Core diameter	50 µm ±2.0 µm
f.	Cladding diameter	125 µm ±1.0 µm
g.	Coating diameter	245 µm ±10 µm
h.	Numeral aperture	0.200 ±0.015/-0.010

2. Single mode fiber specifications:

a.	Attenuation (max)	0.7 dB/km @ 1310nm 0.7 db/km @ 1550nm
b.	Dispersion (max)	
1)	1285-1330nm	3.2 ps/nm-km
2)	1550nm	18 ps/nm-km
3)	Cut-off wavelength	1260 ±100.0 µm
4)	Core diameter	8.3 µm

5) Cladding diameter 125.0 ±2.0 µm
6) Coating diameter 245.0 ±10.0 µm

B. Manufacturers: Subject to compliance with requirements, provide products by the following

1. Avaya SYSTIMAX LazrSPEED 300

2.3 FIBER OPTIC PATCH PANEL

A. Specifications

1. 12 gauge aluminum alloy construction
2. 19" rack mount
3. Grommeted entrance holes
4. Internal fiber managers
5. Front label holder
6. Modular construction
7. Snap in activation adapter plates
8. Duplex SC style termination

B. Manufacturers: Subject to compliance with requirements, provide products by the following

1. Avaya SYSTIMAX 600ALS Series

2.4 FIBER OPTIC CONNECTORS

A. Specifications

1. General

a. Duplex SC type connector
b. Keyed connector
c. Ceramic ferrule
d. Epoxy based

2. Multi-mode:

a. Beige in color
b. Maximum insertion loss of 0.30 dB at 850 or 1300 nm.

3. Single-mode:

a. Blue in color

b. Maximum insertion loss of 0.30 dB at 1310 or 1550 nm.

B. Manufacturers: Subject to compliance with requirements, provide products by the following

1. Avaya SYSTIMAX

2.5 FIBER OPTIC EQUIPMENT CORDS

A. Specifications

1. Fiber specifications as listed above
2. Duplex SC connectors, beige for multimode, blue for single mode
3. 1 meter in length

B. Manufacturers: Subject to compliance with requirements, provide products by the following

1. Avaya SYSTIMAX

2.6 UTP HORIZONTAL CABLE

A. Specifications

1. ANSI/EIA/TIA Category 6
2. 4 - pair, 24 AWG solid bare copper
3. Construction as indicated in Project Documents
4. Tested through 300 Mhz

B. Manufacturers: Subject to compliance with requirements, provide products by the following

1. Avaya SYSTIMAX 2081 XL

2.7 CATEGORY 6 PATCH PANELS

A. Specifications:

1. Modular rack mounted
2. ANSI/EIA/TIA Category 6 RJ-45 connectors
3. Port count as indicated in Project Documents
4. Tested through 250 MHz
5. S310 termination blocks
6. Cable manager
7. Snap in color coded icons

B. Manufacturers: Subject to compliance with requirements, provide products by the following

1. Avaya SYSTIMAX PATCHMAX GS3

2.8 CROSS CONNECT AND PATCH CORD ASSEMBLIES

A. Specifications:

1. ANSI/EIA/TIA Category 6
2. 4 pair RJ45
3. Strain relief boot
4. Snap in color coded icon
5. 2.1 meters in length
6. Tested to 250 MHz

B. Manufacturers: Subject to compliance with requirements, provide products by the following

1. Avaya SYSTIMAX

2.9 Work Area Equipment

A. Specifications

1. Work Area Faceplates

a. UV resistant high impact plastic face plate
b. Single gang plate
c. Modular design
d. Snap in activation modules
e. Color coded snap in icons
f. Protected designation labels

2. Cat 6 Data Couplers

a. Snap in activation modules
b. Angled single and double coupler
c. Color coded snap in icons
d. Category 6 compliant
e. Tested to 250 MHz
f. T568A/B wiring

3. Fiber Optic Couplers

a. Snap in activation modules
b. Angled single and double coupler
c. Color coded snap in icons
d. Duplex SC type connector

B. Manufacturers: Subject to compliance with requirements, provide products by the following

1. Avaya SYSTIMAX

2.10 FIRESTOPPING

A. General

1. Provide Fire stopping Materials for Horizontal Cabling as indicated in Project Documents
2. Provide all labor and materials to maintain fire stopping at all penetrations at all times during construction
3. Provide all labor and materials necessary to insure adequate fire stopping at all penetrations at completion.

B. Specifications:

1. Provide pillow type intumescent fire stop material
2. ASTM E814(UL 1479) tested

C. Manufacturers: Subject to compliance with requirements, provide products by one of the following

1. A/D FIREBARRIER
2. Grace Construction Products FlameSafe
3. Specified Technologies, Inc. SpecSeal

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:

1. Follow all ANSI/EIA/TIA installation guidelines
2. Follow all cabling solution provider installation guidelines

B. Telecommunications Rooms

1. Install all Horizontal Cable System Telecommunications Room equipment as indicated in Project Documents
2. Install cable management to support and train cables with spacing as required to meet bend radius and support requirements.
3. Install all cabling and secure in a high state of dress utilizing wire management and Velcro Straps.

C. Work Area

1. Install all Horizontal Cabling System Work Area equipment and cabling as indicated in Project Documents
2. Do not exceed recommended pulling tensions
3. Route Category 6 LAN cabling from outlets to patch panel in the nearest telecommunication closet.
4. Do not exceed 90 meter horizontal length for Category 6 cables. Notify the Architect immediately if any Category 6 route exceeds 90 meters.
5. Terminate enhanced Category 6 data cabling per T568B wiring method.

    a. Maintain wire twists to withing 0.5 inches of termination.
    b. Remove no more than 1.0 inches of cable jacket.

6. Use only Velcro Straps to secure and dress Category 6 cabling.

D. Grounding:

1. Ground all equipment as per manufacturer's recommendations, NEC and TIA/EIA guidelines.
2. Provide equipment grounding conductor from equipment grounding lugs to TMGB/TGB.

3.2 LABELING

A. General:

1. Provide labeling based on ANSI/TIA/EIA-606 administration concepts
2. Provide typewritten labels, hand labeling is not acceptable
3. Administration database shall utilize identifiers on labels

B. Telecommunication Spaces and Pathways:

1. Use the identifier EF for the Telecommunications Entrance Facility
2. Use the identifier MC for the Main Cross-Connect
3. Provide an identifier for each Intermediate Telecommunications Room that indicates the floor and an ordinal designation (e.g. 2TRW is the second floor telecommunications room on the West side of the building)

4. Provide an identifier for each Relay Rack in each Telecommunications Space that incorporates the Telecommunications Space identifier (e.g. 2TRW-RR3 is the third relay rack in the second floor telecommunications room on the west side of the building).
5. Provide an identifier for each Telecommunications Pathway

C. Telecommunication Space Terminating Hardware:

1. Provide an identifier for each Patch Panel that incorporates the Relay Rack identifier (e.g. 2TRW-RR3-PP1 is the first patch panel in the third relay rack in the second floor telecommunications room on the west side of the building.)
2. Provide an identifier for each Patch Panel port that incorporates the Patch Panel identifier (e.g. 2TRW-RR3-PP1-09 is the ninth port on the first patch panel in the third relay rack in the second floor telecommunications room on the west side of the building)

D. Work Area

1. Provide an identifier for each Work Area Activation Point that indicates the room number and an ordinal designation (e.g. 142A is the first activation point in room 142).
2. Provide an identifier for each Work Area Activation Point jack that Work Area Activation Point designation (e.g. 142A-2 is the second jack in the first Activation Point in room 142).

E. Horizontal Cable:

1. Provide the cable's Patch Panel Port identifier and Work Area Activation Point Jack identifier on both ends of all Horizontal cables.
2. Insure that label is intact after termination of cable.

3.3 TESTING

A. General

1. Certify systems are complete and functional.
2. Test all cabling and connections. Perform final functional tests in presence of the Architect.
3. Complete certified testing report that includes hard copy of actual test data of all Category 6 cable drops.

B. Category 6 Copper Cable Testing:

1. Test each cable with a level III field tester utilizing a link test for the

following parameters:

a. Wire map
b. Length
c. Attenuation
d. Power sum Near-End Crosstalk (PS-Next) loss.
e. Equal Level Far End Cross Talk (ELFEXT) loss.
f. Power Sum Equal Level Far End Cross Talk (ELFEXT) loss.
g. Return Loss
h. Skew

2. Test each cable to the most current TIA/EIA specifications for field-testing of unshielded twisted-pair cabling systems.
3. Test each cable from patch panel to station location and record the results.
4. If any tested cable fails after repeated re-testing to achieve a passing test:

   a. Re-terminate both ends and re-test.
   b. If re-test fails, replace cable at not additional cost to the Owner/User.

5. Test report:

   a. Indicate the station identification
   b. Indicate the date of the test
   c. Indicate the name of the tester
   d. Indicate all minimum and maximum criteria the tester is measuring.
   e. Indicate a “Pass” condition for all cables.

END OF SECTION 17260